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PROGRAM

Arkansas Academy of Science

Seventy-fourth Annual Meeting

6-7 April 1990

ARKANSAS STATE UNIVERSITY

Jonesboro, Arkansas

Meeting concurrently with sessions of

The Collegiate Academy of Science

Friday, 6 April 1990

Paper Sessions

Aquatics/Invertebrates/Lower Vertebrates
Botany
Engineering A
Engineering B
Symposium: Chemistry in the 90's
Hospitality Hour
Sponsored by University of
Arkansas for Medical Sciences
Buffet Dinner
Speaker:
Dr. Bassam Shakhshiri
National Science Foundation

Saturday, 7 April 1990

Paper Sessions

Biomedical/Microbiology
Geology/Mathematics/Science Education
Chemistry
Higher Vertebrates
Physics

Sigma Xi Breakfast

The traditional Sigma Xi Breakfast will be held at the Ramada Inn on April 7, 1990, beginning at 7:00 a.m.

Acknowledgments

Appreciation is extended to the following exhibitors:

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SECTION PROGRAMS

[*Undergraduate Student Competition

**Graduate Student Competition]

Friday, April 6, 1990
Afternoon Session

AQUATICS/INVERTEBRATES/LOWER VERTEBRATES

Chairperson: Dr. Henry W. Robison, Southern Arkansas University

THE AQUATIC MACROINVERTEBRATES OF THE ST. FRANCIS SUNKEN LANDS.

B.G. Cochran and G.L. Harp, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

SOME BIOLOGICAL ASPECTS OF *Hydroporus ouachitus* MATTA AND WOLFE (COLEOPTERA: DYTISCIDAE).

George L. Harp, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

BIODIVERSITY OF TRICHOPTERA IN THE OZARK AND OUACHITA MOUNTAINS: A PREVIEW OF THINGS TO COME.

Stephen R. Moulton and Kenneth W. Stewart, Department of Biological Sciences, University of North Texas, Denton, TX 76203, and Henry W. Robison, Southern Arkansas University, Magnolia, AR 71753.

REPRODUCTIVE PHENOPHASES AND CLUTCH CHARACTERISTICS OF SELECTED ARKANSAS AMPHIBIANS.

Stanley E. Trauth, Department of Biological Sciences, Arkansas State University, State University, AR 72467; Brian P. Butterfield, Department of Zoology and Wildlife Sciences, Auburn University, Auburn University, AL 36849; Walter E. Meshaka, Archbold Biological Station, P.O. Box 2057, Lake Placid, FL 33852; David A. Saugey, U.S. Forest Service, P.O. Box 255, Mt. Ida, AR 71957; and Robert L. Cox, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

INTERSECTION OF CHIRONOMIDAE (DIPTERA) AND MERMITHIDAE (NEMATODA) FAMILIES AT FOUR GLACIAL LAKES IN CLEARWATER COUNTY, MINNESOTA.

Clarence E. McMahon, Hendrix College, Conway, AR 72032.

TRANSOVARIAN TRANSMISSION OF *Pleistophora ovariae* IN THE GOLDEN SHINER (*Notemigonus crysoleucas*).

Lawrence W. Hinck and Stanley E. Trauth, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

GENERATING COST ESTIMATES FOR BAITFISH PRODUCTION IN ARKANSAS.

Gayle Pounds, Larry Dorman, and Carole Engle, Department of Agriculture, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

BIOLOGY OF THE GRAVEL CHUB *Erimystax x-punctata* (CYPRINIDAE), IN THE OUACHITA RIVER SYSTEM, ARKANSAS.

John L. Harris, Environmental Division, Arkansas Highway and Transportation Department, Little Rock, AR 72203.

ADDITIONAL DISTRIBUTION RECORDS FOR THE OUACHITA MADTOM, *Noturus lachneri* (ICTALURIDAE), FROM THE OUACHITA RIVER SYSTEM.

John L. Harris, Environmental Division, Arkansas Highway and Transportation Department, and Henry W. Robison, Department of Biology, Southern Arkansas University, Magnolia, AR 71753.

A LIGHT TRAP SURVEY OF THE FEMALE ADULT MOSQUITOES OF CRAIGHEAD COUNTY, ARKANSAS, IN 1986 AND 1987.

Richard E. Holman and Larry A. Olson, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

THE STATUS OF *Eurycea tynerensis* IN NORTHERN ARKANSAS.
Alvan A. Karlin, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204, and Paul Polechla, Department of Zoology, University of Arkansas at Fayetteville, Fayetteville, AR 72701.

*MERMITHID NEMATODES: A COMPARISON OF PRESERVATION FOLLOWING CRITICAL POINT DRYING AND HEXAMETHYLDISILIZANE DRYING.

Chris C. Hemann and A. Johnson, Department of Biology, Hendrix College, Conway, AR 72032, and W. Bowen, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

*COMPARISON OF WATER QUALITY IN STREAMS FROM DIFFERENT ECOREGIONS IN INDEPENDENCE COUNTY, ARKANSAS.

E. Winnifred Fraser, Arkansas College, Batesville, AR 72501, and Jennie F. Weston, Box 84, Cave City, AR 72521.

BOTANY

Chairperson: Dr. Robert Wright, University of Central Arkansas

SCREENING RICE (*Oryza sativa* L.) GENOTYPES FOR DROUGHT TOLERANCE UNDER FIELD CONDITION.

Mazo Price, and Md. Jalaluddin, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601, and R.H. Dilday, USDA/ARS, Stuttgart, AR 72160.

SENSITIVE PLANT SPECIES OF THE "WINDING STAIRS" AREA, LITTLE MISSOURI RIVER, OUACHITA NATIONAL FOREST.

Vernon Bates, P.O. Box 1473, Mena, AR 71953.

A NEW COMPOSITAE SPECIES FROM THE OUACHITA MOUNTAINS OF ARKANSAS.

Albert B. Pittman and Vernon Bates, Department of Arkansas Heritage, 225 East Markham, Suite 200, Little Rock, AR 72201, and Robert Kral, Department of Biology, Vanderbilt University, Nashville, TN 37235.

PRAIRIE RESTORATION IN NORTHWEST ARKANSAS.

Edward E. Dale, Jr., Department of Botany and Microbiology, University of Arkansas, Fayetteville, AR 72701.

THE VEGETATION OF SARATOGA LANDING BLACKLAND PRAIRIE.

Thomas L. Foti, Arkansas Natural Heritage Commission, Department of Arkansas Heritage, 225 East Markham Street, Little Rock, AR 72201.

ALLOZYME AND MORPHOMETRIC VARIATION IN *Haplopappus gracilis*.

Kenneth J. Freiley, University of Central Arkansas, Conway, AR 72032.

PHOTOSYNTHETIC COMPETENCE OF AN ENDANGERED SHRUB, *Lindera melissifolia*.

Robert D. Wright, University of Central Arkansas, Conway, AR 72032.

**SEXUAL DIMORPHISM AND INTERSEXUAL DIFFERENCES IN RESOURCE ALLOCATIONS OF A DIOECIOUS SHRUB, *Lindera melissifolia* (WALT.) BLUME.

Dennis J. Richardson, Robert D. Wright, and Shannon Walker, Department of Biology, University of Central Arkansas, Conway, AR 72032.

Program

*A COMPARISON OF METHODS FOR EXTRACTING DNA FROM RICE.

Theresa L. Hines, Neela R. Patel, Michael L. Sikes, Daoud Abu-Diab, and Alvan A. Karlin, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

**USING NON-NODULATING SOYBEANS TO ESTIMATE BIOLOGICAL NITROGEN FIXATION.

W.F. Johnson, Jr., D.C. Wolf, and T.K. Walker, Department of Agronomy, University of Arkansas, Fayetteville, AR 72701.

**CHARACTERIZATION AND SELECTION OF SOFT WHEAT FOR NITROGEN UTILIZATION.

J.T. Kelley and R. K. Bacon, Department of Agronomy, University of Arkansas, Fayetteville, AR 72701.

REVISING THE TAXONOMY OF THE TWO MOST COMMON MICROSCOPIC SLIME MOLDS.

Frederick W. Spiegel, Department of Botany and Microbiology, University of Arkansas, Fayetteville, AR 72701.

ENGINEERING 1-A

Chairperson: Dr. Robert Engelken, Arkansas State University

**EVALUATION OF WETTING AGENT EFFECTS ON THE BEER COATING OF POLISHED SILICON WAFERS.

Gary Fuller, Kamesh Gadepally, and Roger Hawk, University of Arkansas at Little Rock, ETAS 575, 2801 South University, Little Rock, AR 72204.

**STUDY OF AN ELECTROSTATIC SPRAY DEPOSITION METHOD USING SILICON POWDER.

Kamesh V. Gadepally, Kevins B. Tennal, and Roger M. Hawk, Electronics and Instrumentation Department, University of Arkansas at Little Rock, ETAS 575, 2801 South University Avenue, Little Rock, AR 72204; Al Robles and James A. Gribbles, Ameron Powder Coating Co., P.O. Box 9610, Little Rock, AR 72219.

**ELECTROSTATIC CHARGE CHARACTERIZATION OF TONERS IN LASER PRINTING PROCESS.

Chaoping Wu, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 South University, Little Rock, AR 72204.

**CHARACTERIZATION OF RADIOACTIVITY IN HOT SPRINGS NATIONAL PARK, ARKANSAS.

C.E. Epperson and N.R. Rhodes, University of Arkansas for Medical Sciences, College of Pharmacy, 4301 West Markham, Little Rock, AR 72205.

**PHOTOACOUSTIC DETECTION OF CARBONACEOUS ATMOSPHERIC AEROSOLS.

Duane Jackson, University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 South University, Little Rock, AR 72204.

**AN ON-LINE PROCESS FIBER OPTIC REFRACTOMETER FOR MEASURING EDIBLE OILS.

Charles F. Cole, Jr., University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 South University, Little Rock, AR 72204.

**DETERMINATION OF ALUMINUM BINDING TO ADENINE NUCLEOSIDES.

Susan G. Brown and Roger M. Hawk, University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 South University, Little Rock, AR 72204.

*PREPARATION OF PHOTOCONDUCTIVE METAL SULFIDE FILMS BY COMBINED MINIMAL HAZARD CHEMICAL PRECIPITATION/ION EXCHANGE PROCESSES.

Robert Engelken, Shahzad Ali, Lip Ngai Chang, Charles Brinkley, and Kevin Turner, Arkansas State University, Department of Engineering, P.O. Box 1740, State University, AR 72467.

ENGINEERING 2-A

Chairperson: Dr. Roger Hawk, University of Arkansas-Little Rock

INTERDISCIPLINARY RESEARCH IN MICROELECTRONICS AT UAF BETWEEN CHEMICAL AND ELECTRICAL ENGINEERING.

R.K. Ulrich, Department of Chemical Engineering, University of Arkansas, Fayetteville, AR 72701; W.A. Brown, S.S. Ang, and H.A. Naseem, Department of Electrical Engineering, University of Arkansas, Fayetteville, AR 72701.

ENGINEERING AND SCIENTIFIC RESEARCH AT PREDOMINANTLY UNDERGRADUATE INSTITUTIONS: CHALLENGES, TOOLS, AND OPPORTUNITIES.

Robert Engelken, Department of Engineering, P.O. Box 1740, Arkansas State University, State University, AR 72467.

A MULTI-DISCIPLINARY RESEARCH LABORATORY AT MISSISSIPPI STATE UNIVERSITY — THE DIAGNOSTIC INSTRUMENTATION AND ANALYSIS LABORATORY.

Robert L. Cook, Richard D. Benton, and Robert A. Green, Mississippi State University, Diagnostic Instrumentation and Analysis Laboratory, P.O. Drawer MM, Mississippi State, MS 39762.

A GRADUATE EDUCATION OPPORTUNITY IN OCCUPATIONAL AND ENVIRONMENTAL HEALTH.

Thomas W. Rimmer, University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 South University, Little Rock, AR 72204.

ENGINEERING: ART, SCIENCE, OR TRADE.

Robert A. Green, Mississippi State University, Diagnostic Instrumentation and Analysis Laboratory, P.O. Drawer MM, Mississippi State, MS 39762.

ENGINEERING 1-B

Chairperson: Dr. M.K. Mazumder, University of Arkansas-Little Rock

A COMPARISON OF PRESSURIZED AND GRAVITY DISTRIBUTION SYSTEMS FOR WASTEWATER TREATMENT.

M.A. Gross, R.T. Muldoon, J.S. Neal, and B. Ederington, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 South University, Little Rock, AR 72204.

ENGINEERING FIELD THEORY — AN INTERDISCIPLINARY APPROACH.

Leo Setian, Engineering Division, John Brown University, Siloam Springs, AR 72761.

IMAGE ENHANCEMENT OF FADED HISTORIC DOCUMENTS.

Barry G. Wells, Department of History, and Robert M. Crisp, Jr., Department of Engineering, 309 Engineering Building, University of Arkansas, Fayetteville, AR 72701.

DISCUSSION ON THE USE OF g_c IN PHYSICS AND ENGINEERING EDUCATION AND PRACTICE.

Larry Byrd, Department of Engineering, P.O. Box 1740, Arkansas State University, State University, AR 72467.

LABORATORY AUTOMATION USING A MICROPROCESSOR

Arkansas Academy of Science

CONTROLLED SAMPLING OSCILLOSCOPE AND A PERSONAL COMPUTER.

Sanjay K. Mitra, Electronics and Instrumentation Department, University of Arkansas at Little Rock, ETAS-575, 2801 South University Avenue, Little Rock, AR 72204.

IMPLEMENTATION OF A LABORATORY DISTRIBUTED CONTROL SYSTEM.

Claudio A. Hernandez and Robert A. Sims, University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 South University, Little Rock, AR 72204.

THE IMPACT OF MICROPROCESSOR PROTECTED MODE PROGRAMMING ON UNDERGRADUATE EDUCATION IN ENGINEERING TECHNOLOGY.

Robert L. Douglas, Engineering Technology, Memphis, State University, Memphis, TN 38152.

EDUCATIONAL SOFTWARE DEVELOPMENT USING HYPERTEXT AND EXPERT SYSTEM SOFTWARE CONCEPTS.

Siripong Malasri, Knowledge Engineering Center, Christian Brothers College, Memphis, TN 38104-5581.

ENGINEERING 2-B

Chairperson: Dr. Larry Byrd, Arkansas State University

IMPROVEMENT IN ENGINEERING DESIGN RESULTING FROM A UNIFIED THEORY OF SCIENCE.

Joseph M. Brown, Department of Mechanical Engineering, Mississippi State University, Mississippi State, MS 39762.

ENHANCING AN ENGINEERING LEARNING ENVIRONMENT.

Paul Palazolo, School of Engineering, Christian Brothers College, 650 East Parkway South, Memphis, TN 38104-5581.

A GONIOMETER-BASED SYSTEM FOR NEONATAL SCREENING OF CONGENITAL HIP DISEASE.

Gaylen G. Burnside and Paul C. McLeod, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 South University, Little Rock, AR 72204.

PRINCIPLES AND CLINICAL APPLICATION OF MAGNETIC RESONANCE.

R.P. Gullapalli and R.M. Hawk, Electronics and Instrumentation Department, University of Arkansas at Little Rock, 2801 South University, Little Rock, AR 72204; T. Evans, Chemistry Department, University of Arkansas at Little Rock, 2801 South University, Little Rock, AR 72204; and R.A. Komoroski, Department of Radiology, University of Arkansas for Medical Sciences, Little Rock, AR 72204.

ALKALI METAL NMR IN MEDICINE AND BIOLOGY.

Rao P. Gullapalli and Roger M. Hawk, Electronics and Instrumentation Department, University of Arkansas at Little Rock, Little Rock, AR 72204; and Richard A. Komoroski, Department of Radiology, University of Arkansas for Medical Sciences, Little Rock, AR 72204.

*FLOW PATTERNS AND GAS MIXING IN A SYMMETRICAL LUNG MODEL.

S. Alzaaim, D.L. Wankum, R. Cole, and J. Hammersley, Graduate Institute of Technology, University of Arkansas at Little Rock, ETAS Building, Room 575, 2801 South University, Little Rock, AR 72204.

SYMPOSIUM: CHEMISTRY IN THE 90'S

Sponsored by the Student Affiliates, American Chemical Society, Arkansas State University

INTRODUCTORY REMARKS — Dr. Jack Lay, National Center for Toxicological Research

"COLD FUSION" — Dr. John Hanneken, Department of Physics, Memphis State University.

"ROOM TEMPERATURE SUPERCONDUCTORS?: A PROGRESS REPORT" — Dr. Anny Morrobel-Sosa, Department of Chemistry, University of Alabama.

"HAZARDOUS WASTE DISPOSAL" — Dr. Charles Waggoner, Department of Chemistry, Mississippi State University.

CLOSING REMARKS — Dr. Jack Lay, NCTR

Saturday, April 7, 1990

BIOMEDICAL/MICROBIOLOGY

Chairperson: Dr. Arthur A. Johnson, Hendrix College

Morning Session

TIME COURSE OF PHOTOREACTIVATION OF UV INDUCED DAMAGE IN G1 PHASE *Xenopus* CELLS THAT LEADS TO CHROMOSOME BREAKS OBSERVABLE BY PREMATURE CHROMOSOME CONDENSATION.

Robert Wright, Stephen Ruble, and Gaston Griggs, Biology Department, John Brown University, Siloam Springs, AR 72761.

HEMATOZOA OF CENTRAL ARKANSAS COMMON GRACKLE.

Arthur A. Johnson, Hendrix College, Conway, AR 72032.

ANTIBODY ENHANCEMENT OF CARCINOGEN FLUORESCENCE IN FIBER OPTIC MICROCHEMICAL SENSORS.

A.M. Hoyt, Jr., University of Central Arkansas, Conway, AR 72032, and M.J. Sepaniak, University of Tennessee, Knoxville, TN 37996.

AXONAL GROWTH THROUGH A GLIAL-DEPLETED ENVIRONMENT.

M.A. Pippenger, T.J. Sims, and S.A. Gilmore, Department of Anatomy, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

CHARACTERIZATION OF A 60 KILODALTON RECOMBINANT *Brucella abortus* IMMUNOGENIC PROTEIN.

R.M. Roop II and M.L. Price, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Slot #511, 4301 West Markham Street, Little Rock, AR 72205-7199; S.M. Boyle and G.G. Schurig, Department of Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA.

CHARACTERIZATION OF THE SIMIAN *Varicella* VIRUS GENOME.

Wayne L. Gray, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Slot #511, 4301 West Markham Street, Little Rock, AR 72205.

**CHARACTERIZATION OF IMMUNOGENIC SIMIAN *Varicella* VIRUS PROTEINS AND GLYCOPROTEINS.

Thomas M. Fletcher III and Wayne L. Gray, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Slot #511, 4301 West Markham Street, Little Rock, AR 72205.

Program

GEOLOGY/MATHEMATICS/SCIENCE EDUCATION

Chairperson: Dr. Robbin Anderson, University of Arkansas-Fayetteville

**SOIL AND LITHOSTRATIGRAPHY BELOW THE LOVELAND SILT, CROWLEY'S RIDGE, ARKANSAS.

Donna Porter, Geology Department, and Sam Bishop, Geography Department, University of Arkansas, Fayetteville, AR 72701.

EFFICIENCY IN COLLECTING FOSSILS.

Kenneth M. Ball, Department of Biology, and Leo Carson Davis, Department of Physical Sciences, Southern Arkansas University, Magnolia, AR 71753.

A TEST FOR MULTIVARIATE NORMALITY.

Roger Abernathy, Department of Computer Science, Mathematics, and Physics, Arkansas State University, Box 70, State University, AR 72467.

DEALING WITH STUDENTS' PRECONCEPTIONS ABOUT PHYSICS: DOES IT MAKE A DIFFERENCE?

Dean Hirschi, University of Central Arkansas, Physics Department, Lewis Science Center, Room 105, Conway, AR 72032.

PERSISTENCE OF REMEDIAL MATHEMATICS STUDENTS.

Laurence J. Boucher, College of Arts and Sciences, Arkansas State University, P.O. Box 1030, State University, AR 72467.

CHEMISTRY 1

Chairperson: Dr. Bryan Palmer, Henderson State University

*EVALUATION OF EPHEDRINE DERIVATIVES AS POSSIBLE APPETITE SUPPRESSANTS.

M. Mateen Akmal, D. Mark Wood, Mehran Karimi, and Richard B. Walker, Chemistry Department, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

*RELATIONSHIPS BETWEEN MUTAGENICITIES OF NITRATED PHENYLFURANS AND THE PRESENCE AND POSITION OF THE NITRO GROUP.

E. Kim Fifer and Gary Gibson, Department of Biopharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, AR 72205; Ali Shaikh, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204; and Robert H. Heflich, Division of Genetic Toxicology, National Center for Toxicological Research, Jefferson, AR 72079.

*THE POTENTIAL OF SMALL PEPTIDE DERIVATIVES AS BLOOD PRESSURE REGULATING AGENTS.

Cathy Cagle and R.M. McConnell, Chemistry Department, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

*SYNTHESIS OF LEUPEPTIN ANALOGS.

Arnita Jones and Rose M. McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

*BIOCHEMICAL ASSAY OF LEUPEPTIN ANALOGS.

Amanda Camp and Rose M. McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

*SYNTHESIS OF PEPSTATIN ANALOGS.

Wanda Jones and Rose M. McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

THE CHEMISTRY OF ATYPICAL RAINFALLS.

D.M. Chittenden II and W.V. Wyatt, Department of Chemistry, Arkansas State University, State University, AR 72467.

THERMAL DECOMPOSITION STUDIES OF SELECTED TRANSITION METAL POLYSULFIDE COMPLEXES.

Benjamin Rougeau, J.E. Bennett, and M. Draganjac, Department of Chemistry, Arkansas State University, State University, AR 72467.

CHEMISTRY 2

Chairperson: Dr. Arthur Hoyt, Jr., University of Central Arkansas

COMPARISON OF THE MOLECULAR STRUCTURES OF MONOVALENT CATION SALTS OF N,N-DIMETHYLDITHIOCARBAMATE. NOVEL SYNTHESIS AND CRYSTAL STRUCTURE OF $(P\bar{O})_2(S_2CN(CH_3)_2) \cdot 2H_2O$.

M. Draganjac and David Minick, Department of Chemistry, Arkansas State University, State University, AR 72467; and E.M. Holt, Department of Chemistry, Oklahoma State University, Stillwater, OK 74078

*ULTRASOUND IN DECAFFEINATION.

Dominic T.C. Yang and Rommy N. Amadi, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204; and Eric U. Yang, Catholic High School for Boys, Little Rock, AR.

CONFORMATIONAL AND CIRCULAR DICHROISM STUDIES OF N-ACETYL-L-PROLYL-D-ALANYL-METHYLAMIDE.

S. Ramaprasad, Department of Radiology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

SYNTHESIS OF CHLORINATED POLYCYCLIC AROMATIC HYDROCARBONS: A NEW CLASS OF GENOTOXIC ENVIRONMENTAL CONTAMINANTS.

Dominic T.C. Yang and Fumiko Yamazaki, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204.

THE EFFECT OF OVERNIGHT FASTING ON GLUTATHIONE CONCENTRATION AND CYTOCHROME P-450 ACTIVITY IN MALE B6C3F₁ MICE.

T.A. McRae, D.W. Roberts, and J.A. Hinson, National Center for Toxicological Research, Jefferson, AR 72079; and D. Ferguson, University of Arkansas at Little Rock, Little Rock, AR 72204.

A DATA ACQUISITION AND CONTROL PROGRAM FOR CHROMATOGRAPHIC AND SPECTROSCOPIC STUDIES.

M. Keith Hudson and Robert Henson, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, Little Rock, AR 72204.

HIGHER VERTEBRATES

Chairperson: David A. Saugey, U.S. Forest Service

SPERMATOOZOA FROM DUCTUS DEFERENS OF *Cnemidophorus sexlineatus* (SAURIA: TEIIDAE): MORPHOLOGY OF THE HEAD AND CHANGES OF MID-PIECE CONFORMATION OBSERVED BY SCANNING ELECTRON MICROSCOPY.

W. Donald Newton, and Stanley E. Trauth, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

PELLET ANALYSIS OF WINTER-ROOSTING LONG-EARED OWLS (*Asio otus*) IN ARKANSAS.

Norman Lavers, Department of English, Philosophy, and Languages, Arkansas State University, State University, AR 72467.

EASTERN OUTPOST OF THE RUFOUS-CROWNED SPARROW IN ARKANSAS.

William M. Shepherd, Arkansas Natural Heritage Commission, Little Rock, AR 72201, and Douglas A. James, Department of Zoology, University of Arkansas at Fayetteville, Fayetteville, AR 72701.

Arkansas Academy of Science

MANAGEMENT OF THE OZARK BIG-EARED BAT, *Plecotus townsendii ingens*, IN ARKANSAS.

Michael J. Harvey, Tennessee Technological University, Department of Biology, Cookeville, TN 38505, and Sam W. Barkley, Arkansas Game and Fish Commission, 2 Natural Resources Drive, Little Rock, AR 72205.

*FECUNDITY OF MALE WHITE-TAILED DEER ON HOLLA BEND NATIONAL WILDLIFE REFUGE.

Thomas Nelson and Michael Johnson, Fisheries and Wildlife Biology Program, Arkansas Tech University, Russellville, AR 72801.

ASPECTS OF REPRODUCTION AND NATURAL HISTORY OF THE BRAZILIAN FREE-TAILED BAT, *Tadarida brasiliensis cynocephala*, IN ARKANSAS.

David A. Saugey and Darrell R. Heath, United States Forest Service, Ouachita National Forest, Hot Springs, AR 71902, and Gary A. Heidt, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

POPULATION DYNAMICS OF THE BOBCAT IN ARKANSAS AFTER EXPLOITATION.

Renn Tumblison, Department of Zoology, Oklahoma State University, Stillwater, OK 74078, and V. Rick McDaniels, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

ANALYSIS OF THE FALL AND WINTER DIET OF THE BOBCAT IN EASTERN ARKANSAS.

Renn Tumblison, Department of Zoology, Oklahoma State University, Stillwater, OK 74078, and V. Rick McDaniels, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

**A SYNOPSIS OF THE BELOSTOMATIDAE OF ARKANSAS.

Phoebe A. Harp and George L. Harp, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

THE MAMMALS OF SOUTHWESTERN ARKANSAS, PART IV: THE INSECTIVORES.

T.W. Steward, V.R. McDaniel, and J.D. Wilhide, Department of Biological Sciences, Arkansas State University, State University, AR 72467, and Dan England, Department of Biology, Southern Arkansas University, Magnolia, AR 71753.

FIRST RECORD OF THE BAT PARASITE *Basilisa boardmanni* (NYCTERIBIIDAE) FROM ARKANSAS.

T.W. Steward, V.R. McDaniel, and H.E. Barton, Department of

Biological Sciences, Arkansas State University, State University, AR 72467, and Dan England, Department of Biology, Southern Arkansas University, Magnolia, AR 71753.

PHYSICS

Chairperson: Dr. Lawrence A. Coleman, University of Arkansas-Little Rock

TEACHING PHYSICS BY BITNET: AN INTERNATIONAL COURSE ON SPECIAL RELATIVITY.

Lawrence A. Coleman, Department of Physics and Astronomy, University of Arkansas at Little Rock, Little Rock, AR 72204.

ROTATIONAL SYMMETRIES OF NUCLEAR STATES: SPIN DETERMINATIONS IN ADVANCED LAB.

W.J. Braithwaite, Department of Physics and Astronomy, University of Arkansas at Little Rock, Little Rock, AR 72204.

STATUS OF THE ACCELERATOR PROJECT AT UNIVERSITY OF CENTRAL ARKANSAS.

Jack Gaiser and Harold Pray, Department of Physics, University of Central Arkansas, Conway, AR 72032.

A METHOD TO MEASURE INTERFACIAL BONDING FROM SURFACE TENSION VALUES OF ORGANIC LIQUIDS.

Subhendra Nath Sarkar, NMR Laboratory, Slot #582, University of Arkansas for Medical Sciences, 4301 West Markham, Little Rock, AR 72205.

DESIGN OF A VISCOMETER USING MAGNETOSTRICTION OF FERROMAGNETIC PROBES.

Subhendra Nath Sarkar, NMR Laboratory, Slot #582, University of Arkansas for Medical Sciences, 4301 West Markham, Little Rock, AR 72205.

THE HEALING WATERS REVISITED: HOT SPRINGS AND RADON.

Max L. Baker and Claude E. Epperson, University of Arkansas for Medical Sciences, Slot 573, 4301 West Markham, Little Rock, AR 72205.

LIGHTNING: A COMPLEX NATURAL PHENOMENON THAT DEFIES SIMPLE ANALYSIS.

Mostafa Hemmati, Physics Department, Arkansas Tech University, Russellville, AR 72801.